CLAIMS

What is claimed is:

1. A power supply regulator, comprising:

a controller configured to cause said regulator to produce more than one regulated input voltage, said regulator coupled to a power source, and said regulator coupled to a microelectronics device for supplying said regulated input voltages to said microelectronics device;

wherein said controller is configured to produce a particular one of said regulated input voltages for each of a plurality of different input voltage required values;

wherein said controller is further configured to maintain each said regulated input voltage within an input voltage range bounded by a constant upper limit and a lower limit; and

wherein said lower limit is determined in accordance with by a gain factor in accordance with a voltage-current loadline.

2. The regulator of claim 1 wherein the number of said regulated input voltages is two.

3. The regulator of claim 1 wherein said controller is further configured to determine said gain factor in order to produce said regulated input voltages according to said loadline, wherein said loadline specifies a linear relationship for said plurality of said regulated input voltage required values, and wherein said lower limit is equal to the lesser of the products of a tolerance level multiplied by each said input voltage required value.

4. The regulator of claim 1 wherein said controller is further configured to adjust said gain factor as required to produce said regulated input voltages according to said loadline, and wherein said loadline specifies a total power voltage-current relationship.

5. The regulator of claim 1 wherein said controller is further configured to adjust said gain factor as required to produce said regulated input voltages according to said loadline, and wherein said loadline specifies a non-linear relationship for said plurality of input voltage required values.

6. The regulator of claim 5 wherein said non-linear loadline further includes a discontinuity corresponding to an intermediate current value between zero and maximum, associated with said microelectronics device.

7. A regulator, comprising:

a controller including a comparator and a threshold detector, wherein an input of said comparator is coupled to the output of said threshold detector;

a switch coupled to said controller and operable in response to a signal provided by said controller, said switch being connected to an inductor, a diode, and an output capacitor arranged in a network that produces a load current in response to an input source voltage received via said switch, said network having an output coupled to a microelectronics device for supplying a plurality of regulated input voltages to said microelectronics device; and

a current sense feedback network connected to said network output and having a gain factor, said feedback network coupled to said threshold detector to cause said threshold detector to produce an output signal as a product of said gain factor;

wherein said controller is configured to produce said regulated input voltages by varying the duty cycle of said switch in accordance with a voltage-current loadline;

said controller being further configured to maintain said regulated input voltages within an input voltage range bounded by a constant upper limit and a lower limit;

wherein said upper limit is constant for each of said input voltage required values; and

wherein said lower limit is computed by said controller in order to maintain said regulated input voltages according to said voltage-current loadline for different values of said load current.

8. The regulator of claim 7 wherein said network is arranged according to a buck converter.

9. The regulator of claim 7 wherein said loadline specifies a linear relationship between said input voltage required values.

10. The regulator of claim 7 wherein said controller computes a gain factor in order to maintain said regulated input voltages according to a total power voltage-current loadline.

11. The regulator of claim 7 wherein said loadline specifies a non-linear relationship between said input voltage required values.

12. The regulator of claim 11 wherein said non-linear loadline further includes a discontinuity corresponding to an intermediate current value between zero and maximum, associated with said microelectronics device.

13. A regulator, comprising:

at least two regulator circuits, each said regulator circuit coupled to a microelectronics device for providing a plurality of regulated input voltages to said microelectronics device, wherein each said regulated circuit provides a particular one of said regulated input voltages to said microelectronics device;

wherein each said regulator circuit further comprises

a controller including a comparator and a threshold detector, an input of said comparator coupled to the output of said threshold detector,

a switch coupled to said controller and operable in response to a signal provided by said controller, said switch connected to an inductor, a diode, and an output capacitor arranged in a network that produces a load current in response to an input source voltage received via said switch,

a current sense feedback network connected to said network output and having a gain factor, said feedback network coupled to said threshold detector to cause said threshold detector to produce an output signal as a product of said gain factor,

wherein said controller is configured to produce one of said regulated input voltages by varying the duty cycle of said switch in accordance with a voltage-current loadline,

wherein said controller is further configured to maintain said regulated input voltage within an input voltage range bounded by a constant upper limit and a lower limit; and

wherein said lower limit is computed by said controller in order to maintain said regulated input voltage according to said voltage-current loadline for different values of said load current.

14. The regulator of claim 13 wherein said network is arranged according to a buck converter.

15. The regulator of claim 13 wherein said loadline specifies a linear relationship between said input voltage required values.

16. The regulator of claim 13 wherein said controller computes a gain factor in order to maintain said regulated input voltage according to a total power voltage-current loadline.

17. The regulator of claim 13 wherein said loadline specifies a non-linear relationship between said input voltage required values.

18. The regulator of claim 17 wherein said non-linear loadline further includes a discontinuity corresponding to an intermediate current value between zero and maximum, associated with said microelectronics device.

19. An electronic system, comprising:

a microprocessor requiring at least two input supply voltages;

a regulator coupled to said microelectronics device; and

a power source coupled to said regulator;

wherein said regulator is configured to produce each said input supply voltage within an input voltage range bounded by an upper limit and a lower limit;

wherein said upper limit is constant for each of said input supply voltages; and

wherein said lower limit is determined by a gain factor multiplied by each said input supply voltage required value.

20. The electronic system of claim 19 wherein said microelectronics device is a processor.

21. The electronic system of claim 19 wherein the number of said input supply voltages is two.

22. The electronic system of claim 19 wherein said regulator is further configured to determine said gain factor in order to produce said regulated input voltages according to a loadline, wherein said loadline specifies a linear relationship for said plurality of said regulated input voltage required values, and wherein said lower limit is equal to the lesser of the products of a tolerance level multiplied by each said input voltage required value.

23. The electronic system of claim 19 wherein said regulator adjusts said gain factor as required to produce said regulated input voltages according to a loadline, and wherein said loadline specifies a total power voltage-current relationship.

24. The electronic system of claim 19 wherein said regulator adjusts said gain factor as required to produce said regulated input voltages according to a loadline, and wherein said loadline specifies a non-linear relationship for said plurality of input voltage required values.

25. The electronic system of claim 24 wherein said non-linear loadline further includes a discontinuity corresponding to an intermediate current value between zero and maximum, associated with said microelectronics device.

26. A regulating method, comprising:

supplying multiple input voltages to one or more microelectronics devices, said multiple input voltages including a plurality of input voltage required values;

determining a lower limit of a voltage regulation range for said multiple input voltages in accordance with a voltage-current loadline; and

maintaining each of said input voltages supplied to said microelectronics devices within said range.

27. The method of claim 26 wherein the number of said regulated input voltages is two.

28. The method of claim 26 wherein said determining further includes selecting a gain factor in order to produce said regulated input voltages according to said loadline, wherein said loadline specifies a linear relationship for said plurality of said regulated input voltage required values wherein said lower limit is equal to the lesser of the products of a tolerance level multiplied by each said input voltage required value.

29. The method of claim 26 wherein said determining further includes adjusting a gain factor as required to produce said regulated input voltages according to said loadline, wherein said loadline is a total power voltage-current loadline.

30. The method of claim 26 wherein said determining further includes adjusting a gain factor as required to produce said regulated input voltages according to said loadline, wherein said loadline specifies a non-linear relationship for said plurality of said regulated input voltage required values.